No. 675,674. Patented June 4, 1901.

F. RITTER.

ELEVATING OR LOWERING DEVICE FOR DENTAL CHAIRS.

(Application filed Feb. 5, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

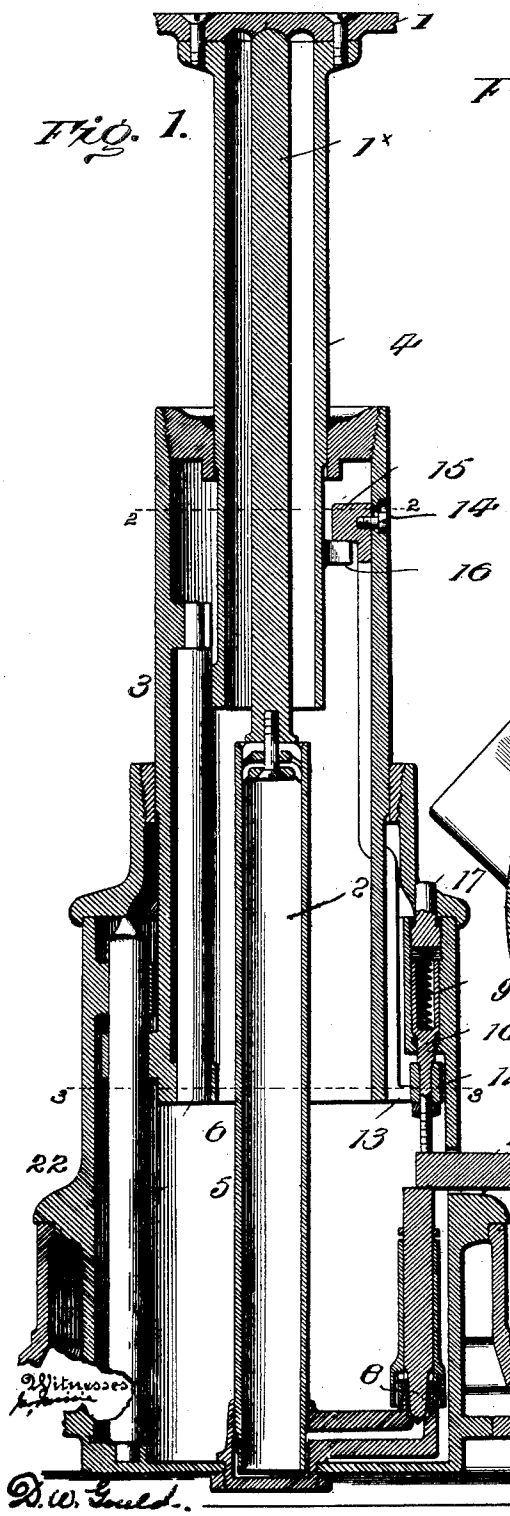


Fig. 2.

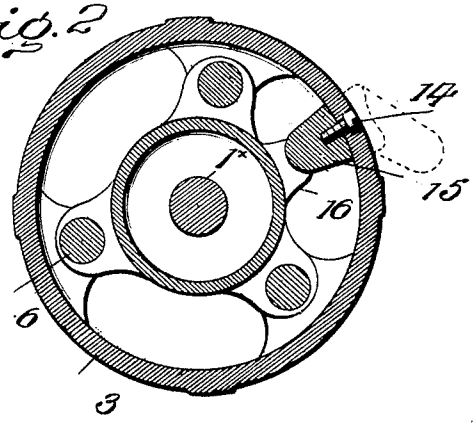
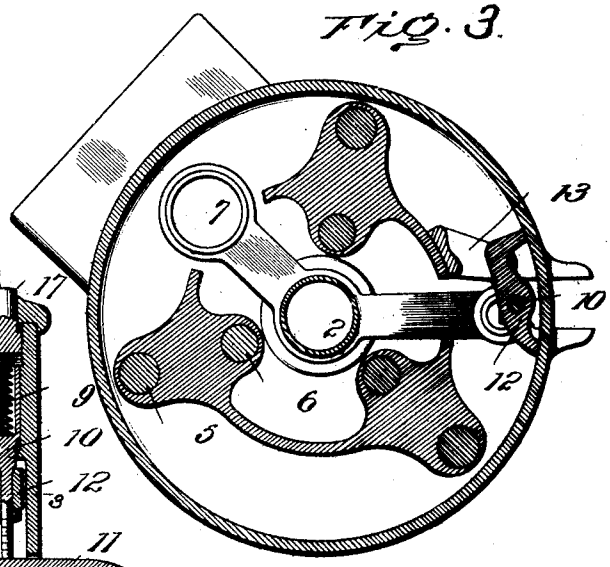


Fig. 3.



Witnesses

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Fig. 5.

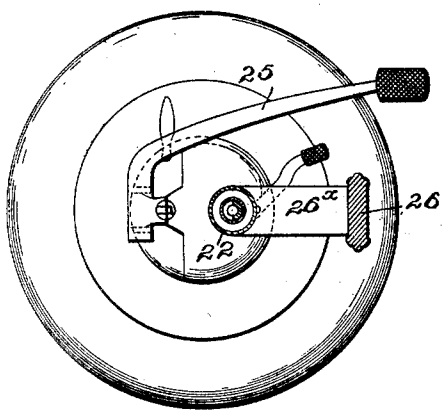


Fig. 6.

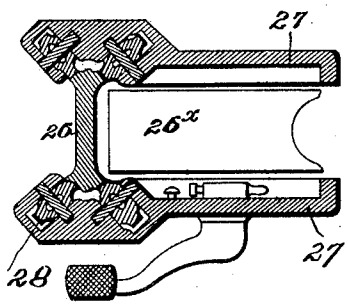
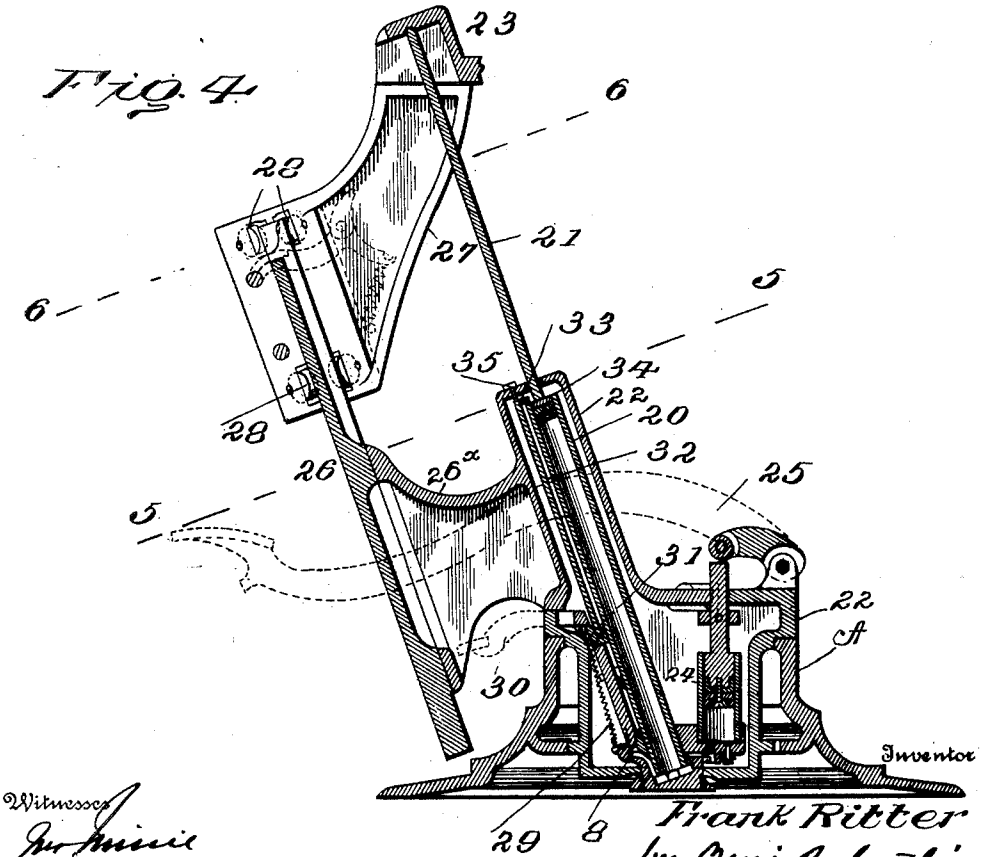


Fig. 4.



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UNITED STATES PATENT OFFICE.

FRANK RITTER, OF ROCHESTER, NEW YORK.

ELEVATING OR LOWERING DEVICE FOR DENTAL CHAIRS.

SPECIFICATION forming part of Letters Patent No. 675,674, dated June 4, 1901.

Application filed February 5, 1900. Serial No. 4,000. (No model.)

To all whom it may concern:

Be it known that I, FRANK RITTER, a resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Elevating or Lowering Devices for Dental Chairs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

The invention relates to means for automatically arresting the ascent of a chair-seat when raised by pumping or otherwise forcing a liquid, such as oil, under a plunger or like device connected to the seat and to devices for lowering the seat at will.

The objects of the invention are to avoid the jar incident to the action of the liquid-forcing device until the ascent of the plunger and chair-seat is suddenly arrested by a fixed stop, as heretofore practiced, and to combine with the mechanism for producing the result specified means for lowering the seat at will.

The invention consists in the construction hereinafter described and pointed out.

In the accompanying drawings, Figure 1 is a section of the supporting mechanism of a chair-seat, a portion of the usual cross-bar of a seat-frame being shown. Fig. 2 is a section on line 2 2 of Fig. 1. Fig. 3 is a section on line 3 3 of Fig. 1. Fig. 4 is a vertical section showing the invention applied to an inclined support for a seat. Fig. 5 is a section on line 5 5 of Fig. 4. Fig. 6 is a section on line 6 6 of Fig. 4.

A denotes a chair-base, and 22 a pedestal rotatably supported thereon.

1 denotes the cross-bar of a seat-frame.

$1^{\times}$ is a plunger, and 2 a plunger-tube.

3 and 4 are telescoping tubes guided, respectively, by rods 5 and 6.

A seat-elevating pump to force oil into the plunger-tube under the plunger in usual manner is indicated at 7. It is of usual form, and therefore need not be fully shown.

8 is a valve controlling the escape of oil from the plunger-tube when the seat descends. It is normally held closed by a spring 9, and 10 is a movable plug by means of which the spring acts on the valve, and 11 a lever pivoted in the chair-pedestal and interposed between the valve and plug to provide for lifting the plug and spring and relieving the valve, so that the latter may open by oil-pressure from below.

12 is a block fixed to plug 10. Said block is situated immediately above the arm of a rod 13, movably mounted at 14 upon the guide-tube 3. The rod has an arm 15 situated in the path of a lug 16, fixed on the inner telescoping tube 4.

In operation when the pump has forced up the plunger and seat and the telescoping tubes to near the greatest desired or practicable height the lug 16 will lift rod 13 and plug 10, compressing spring 9, and permit the relief-valve to open. This renders a continuance of the pumping ineffective and avoids the jar or shock which would otherwise occur when the pump forced the parts against a stop, as heretofore practiced. The arrest of the pumping allows the spring to close the relief-valve, and the seat and plunger easily and simultaneously settle to a fixed position on the oil column. The adjustability of the screw-plug 17 provides for varying the tension of spring 9. In the instance just described the relief-valve 8 is opened by a rod 13, having an arm 15 in the path of a lug 16, fixed to a telescoping tube surrounding the plunger and connected to the latter through the medium of the chair-seat frame 1, which is supported on said plunger. It is obvious that the particular lug 16 and tube 4 are not essential and that the valve-releasing rod 13 may be automatically operated by other equivalent devices—as shown in Fig. 4, for example. In said Fig. 4, numeral 20 denotes a plunger-tube, and 21 a seat raising and lowering plunger, these parts being inclined to a vertical plane and adapted to operate in an inclined pedestal 22. A part of a seat-frame is indicated at 23. A seat-elevating pump is denoted by 24 and its operating-lever by 25. A seat-guiding standard or frame fixed to the pedestal is denoted by 26, which is fixed to the pedestal 22 by a web $26^{\times}$. Arms fixed to the seat-frame at 23 (see Fig. 4) are indicated by 27. Said arms are fixed to the seat-frame 23, (partially shown,) one on each side of the plunger, and carry antifriction-rollers 28, bearing on suitably-formed faces on the guiding-frame. These

devices steady and guide the seat as it is raised or lowered by means of the plunger and coöperating mechanism.

8 denotes a relief-valve which when opened permits the seat-supporting liquid column to discharge and the seat to descend by gravity.

29 is a spring to hold the valve in its seat.

30 is a pedal-lever by which the spring may be overcome at will to permit the pressure of the seat-supporting liquid column to open the valve and allow outflow of the liquid. In this form the spring is connected to the valve by the medium of the lever 30, which normally bears on a block 31, contiguous the valve-stem, and is virtually a part thereof. As illustrated, the spring holds the lever on the part 31, and thereby normally holds the valve closed. The lever can be operated to overcome the spring and permit the valve to be opened by fluid-pressure, whereby the seat can be lowered at will and to any desired extent.

32 denotes a rod fixed to the part 31 on the valve-stem and extends to near the top of the pedestal and to a point above the plunger-tube, at which point it is provided with an arm 33, that extends over the upper end of said tube and into the path of the plunger foot or piston 34. When the plunger is forced up by the action of the pump and approaches the upper end of its possible path, its foot 34 engages the arm 33, overcoming spring 29 and permitting the relief-valve to open, with the effect to neutralize the seat-lifting action of the pump without the medium of a fixed stop, as heretofore practiced.

35 denotes an adjustable stop to regulate the extent of the opening of the valve.

In my Patent No. 619,226, dated February 7, 1899, is set forth an elevating and lowering mechanism comprising a load support or plunger, a tube containing a fluid column to move the load and its support, and a relief-valve to discharge the fluid column to lower the load, said valve being closed by a spring and opened by fluid-pressure upon suitable operation of a treadle.

My present improvement relates to means automatically operated to open and close the fluid-column-discharging valve. I am aware that a relief-valve normally held closed by fluid-pressure coöperating with a spring, said valve being combined with a check-valve between itself and a pump or fluid reservoir and with a spring-held sliding rod and a supplemental sliding rod, is not new, and I therefore do not claim the same.

My improved construction is characterized by its greater simplicity and by its principle of operation in that it provides for opening the relief-valve by fluid-pressure, the valve being normally held closed against fluid-pressure by a spring which also acts to return the sliding connection intermediate the load-support and valve. The relief-valve will be closed by the spring as soon as the seat is lowered sufficiently to release the rod or as soon as the action of the pump is arrested, it being a purpose of the invention to neutralize the action of the pump and avoid the shock which would otherwise result and to effect this by a momentary opening of the relief-valve.

Having thus described my invention, what I claim is—

1. In an elevating mechanism, a tube holding a fluid column to support the load, a support intermediate the load and column, an opening to discharge the fluid, a relief-valve, a spring to normally hold said valve closed against the pressure of the fluid column, and a spring-releasing tripping device actuated directly by the load-support to automatically overcome the spring and permit the valve to be opened by fluid-pressure, said valve closing immediately upon the beginning of the descent of the load.

2. In an elevating mechanism, a tube holding a fluid column to support the load, a support intermediate the load and column, an opening to discharge the fluid, a relief-valve, a spring to normally hold said valve closed against the pressure of the fluid column, and a spring-releasing tripping device in the path of the load-support to automatically overcome the spring and permit the valve to be opened by fluid-pressure, said tripping device consisting of a stop on the load-support and a rod extending from the vicinity of the stop to that of the spring, said valve closing immediately upon the beginning of the descent of the load.

3. In an elevating mechanism, the combination of a tube holding a fluid column to support the load, a support intermediate the load and column, an opening to discharge the fluid, a relief-valve, a spring to normally hold said valve closed against the pressure of the fluid column, and a spring-releasing tripping device in the path of the load-support to automatically overcome the spring to permit the valve to be opened by fluid-pressure, said valve closing immediately upon the beginning of the descent of the load, and means for overcoming the spring at will.

4. In an elevating mechanism, a tube holding a fluid column to support the load, a support intermediate the load and column, an opening to discharge the fluid, a relief-valve, a spring to normally hold said valve closed against the pressure of the fluid column, and a spring-releasing tripping device in the path of the load-support to automatically overcome the spring to permit the valve to be opened by fluid-pressure, said tripping device consisting of a bar having a part in the path of the load-support but disconnected therefrom, the spring being adapted to close the valve immediately upon the descent of the load-support.

5. In an elevating mechanism, a tube holding a fluid column to support the load, a support intermediate the load and column, an opening to discharge the fluid, a relief-valve, a spring to normally hold said valve closed

against the pressure of the fluid column, and a spring-releasing tripping device in the path of the load-support to automatically overcome the spring and permit the valve to be opened by fluid-pressure, said tripping device consisting of a bar having a part in the path of the load-support but disconnected therefrom, the spring being adapted to close the valve immediately upon the descent of the load-support, the valve and the automatically-acting valve-operating devices being entirely inclosed.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FRANK RITTER.

Witnesses:
WM. F. LYNN,
JOHN H. CHADSEY.